Wireless communications offer public safety agencies the capabilities to improve their responses to emergencies.

This can be achieved by offering advanced mission-critical communications such as push-to-talk (PTT) voice communications, and through the use of unlicensed spectrum (such as WiFi) to provide additional communication channels in order to assist first responders in serving the emergency more efficiently (e.g. by using video feedback).

CREATING ON-DEMAND INCIDENT AREA NETWORKS WITH **NETOS®**

NetOS® can be used in a network to improve the responsiveness and efficiency of the emergency services by the fast deployment of an incident area network, enabling:

● Robust, mission-critical, interoperable public safety communications

● Effective and efficient use of all the available spectrum, including sharing licensed and unlicensed spectrum resources

● Advanced Software Defined Networking technologies such as Network Slicing and Splicing

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Smart Stadium scenario

The network within a large sports stadium would typically provide connectivity to fans and visitors via an infrastructure consisting of:

- Wireless access network e.g. WiFi, 4G, etc.
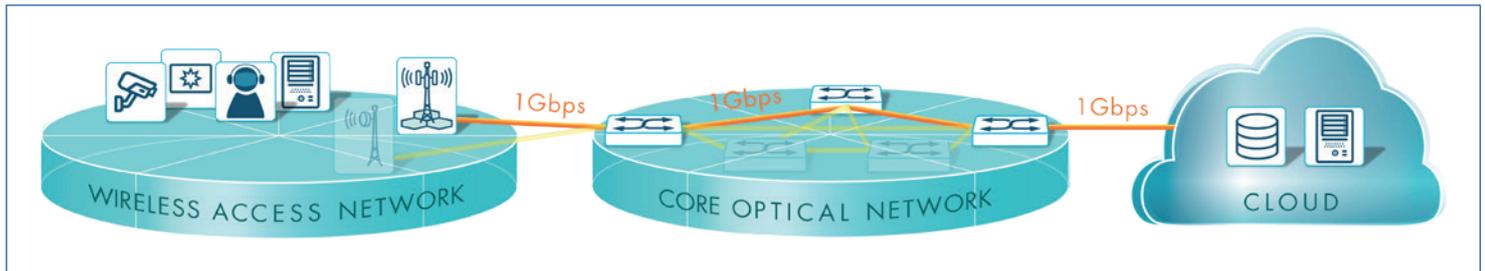- Core Optical network
- Cloud infrastructure

Fig 1. NetOS® can create on-demand 'network slices' with guaranteed Quality-of-Service and full control to support AR/VR Applications, CCTV video analytics, digital signage and more

Assuming this network is controlled by NetOS®, it would be possible to define a 'slice' of the network dedicated to the visitors to the stadium (coloured amber in Fig. 1), so they are able to:

- Access exciting new services such as Augmented/Virtual Reality when they visit the stdium

- Receive bespoke content directly to their Smartphones
- Enable location services (e.g. personalised information, adverts, etc.) delivered to nearby digital signage displays
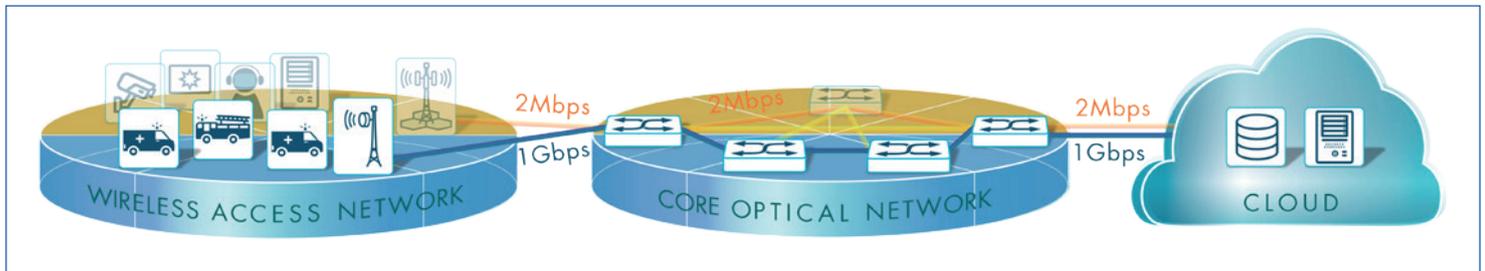- Inform the authorities of their presence via CCTV or other sensors

Fig 2. NetOS® allows the network to be dynamically reconfigured on external triggers if required (e.g. emergency)

In case of an emergency, NetOS® has the capability to create a new, on-demand slice on the same network which can absorb most of the available bandwidth so it can serve the emergency (coloured blue in Fig. 2).

The creation of this blue slice can be triggered manually or automatically by an external event (such as a fire alarm, for example). This can create a local area network around the incident location and connects to the backbone of the network (backhauling) with guaranteed bandwidth.

Network Slicing: Such a dynamic re-allocation of network resources is possible thanks to NetOS® and its network slicing capability which enables the creation of virtual sub-networks each with its own key parameters.

Network Splicing: Additionally, NetOS® enables a seamless connectivity between different technologies and domains (access, core and Cloud) thanks to its network splicing capability i.e. its ability to construct the aggregated, unified topology of the network end-to-end.

SDN Technologies used in an Incident

Area Network:

- **Network Slicing** - Providing visitors with their own 'network slice' to acquire and deliver dedicated content, and allowing on-demand generation of 'first responders' slice' in case of emergency , providing instant connectivity to complement existing networks

- **Network Splicing** - 4G/5G Small Cell and WiFi seamless connectivity

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